



Discussion Paper - NAFSMA TMDL Program Position

Approved January 18, 2002

This paper provides information supporting the National Association of Flood and Stormwater Management Agencies' (NAFSMA) position statement¹ and recommendations for the federal Total Maximum Daily Load (TMDL) program.

INFORMATION SUPPORTING NAFSMA TMDL PROGRAM POSITION

In 2000, Congress requested the National Research Council (of the National Academy of Sciences) to examine the scientific basis of the Total Maximum Daily Load (TMDL) program. Their report, Assessing the TMDL Approach to Water Quality Management², was published in 2001.

This National Academy of Sciences (NAS) report documents several significant issues affecting the legitimacy and efficient, effective implementation of the TMDL program and recommends actions that can resolve these issues.

NAFSMA members' experiences with the TMDL Program (and directly related Clean Water Act (CWA) water quality standards and stormwater National Pollutant Discharge Elimination System (NPDES) programs) are consistent with the findings and recommendations of the NAS report, which in turn support the NAFSMA TMDL position. These findings and recommendations are discussed below.

The TMDL Program and Water Quality Standards

The report highlights the critical connection between the TMDL and water quality standards programs, stating that "The TMDL process is primarily a measurement process and as such is significantly impacted by the setting of water quality standards. Water quality standards consist of two parts: a specific desired use appropriate to the waterbody, termed a *designated use*, and a *criterion* that can be measured to establish whether the designated use is being achieved."³

The "catch 22" of this relationship is that, as the report states, "if the standards are flawed (as many are), all subsequent steps in the TMDL process will be affected."⁴ The report documents that these flaws characterize both parts of the standards, designated uses and criterion: "Many waters now on state 303d lists were placed there without the benefit of adequate water quality standards, data, or waterbody assessment."⁵

The TMDL Program and Use Attainability Analysis

In addressing these shortcomings and recognizing the “need to make designated use and criteria decisions on a waterbody and watershed-specific basis,”⁶ the NAS report states that “an appropriate water quality standard must be defined before a TMDL is developed...and within the framework of the Clean Water Act (CWA), there is an opportunity for such analysis, termed use attainability analysis (UAA).”^{7 a}

Use Attainability Analyses result in “best available science” (BAS) being applied to the TMDL process using existing waterbody and watershed-specific data to define appropriate water quality standards. In addition, they can be accomplished in a timely manner and address community values using existing information and the flexibility in the Clean Water Act. The resulting standards can then be adjusted over time through adaptive management, if necessary.

A Use Attainability Analysis (UAA), as the report states, “determines if impairment is caused by natural contaminants, non-removable physical conditions, legacy pollutants, or natural conditions.”⁸ As noted in the report, “In the 1990s, TMDLs were undertaken for some waterbodies where the designated use was not attainable for reasons that could have been disposed of by a UAA. For example, TMDLs conducted in Louisiana resulted in the conclusion that even implementing zero discharge of a pollutant would not bring attainment of water quality standards. A properly conducted UAA would have revealed the true problem - naturally low dissolved oxygen concentrations - before the time and money were spent to develop the TMDL.”⁹

Further, and perhaps more importantly, a UAA allows for the participation of watershed stakeholders and for the appropriate use designation to reflect a social consensus, as noted in the report: “Appropriate use designation for a state’s waterbodies is a policy decision that can be informed by technical analysis. However, a final selection will reflect a social consensus made in consideration of the current condition of the watershed, its predisturbance condition, the advantages derived from a certain designated use, and the costs of achieving the designated use.”¹⁰

The NAS report cites a common situation encountered by NAFSMA urban municipal members to highlight the fact that *appropriate* use designations will “unavoidably”¹¹ need to reflect a social consensus:

“In many areas of the United States, human activities have radically altered the landscape and aquatic ecosystems, such that an appropriate designated use may not necessarily be the aquatic life condition that was present in a watershed’s predisturbance condition, which may be unattainable. For example, a reproducing trout fishery in downtown Washington, D.C., may be desired, but may not be attainable because of the development history of the area or the altered hydrologic regime of the waterbody.”¹²

Thus, requiring a UAA can legitimize the TMDL Program by identifying a true and specific “description of a desired endpoint for a waterbody,”^{13b} and avoiding the inefficient and ineffective pursuit of unattainable goals.

The TMDL Program and Redefining Success

The NAS report recommends that TMDL program success be redefined from “administrative outcomes”^{14c} to that of “improving the condition of waterbodies as measured by attainment of designated uses.”¹⁵ A UAA is the first step in redefining a successful program. However, with the program now primarily targeting nonpoint sources of pollutants, it is critical for the program’s success that Congress acknowledges and addresses nonpoint source pollution and the “reality of uncertainty in water quality management”¹⁶ by “incorporating the elements of adaptive implementation into TMDL guidelines and regulations.”¹⁷

The NAS report documents this shift in “focus of water quality management from effluent-based to ambient-based water quality standards.”^{18d} It notes that with “the reduction in pollutant loading from point sources such as sewage treatment plants over the last 30 years, the successful implementation of most TMDLs will require controlling nonpoint source pollution.”¹⁹

Controlling nonpoint sources of pollution will be a challenge since:

- “Pollutants from nonpoint sources are derived from diffuse and hard-to-monitor origins,”²⁰
- As documented in a General Accounting Office Report, “only three states claimed to have sufficient data to determine TMDLs for waterbodies impaired primarily by nonpoint sources,”²¹ and
- Discharges from municipalities, defined as point sources in the NPDES program under which TMDLs are implemented, are primarily composed of nonpoint source pollutants and municipalities do not have the authority to regulate the majority of these pollutants. For example, such sources include federal facilities, legacy pollutants from Superfund sites, atmospheric deposition, metal roofs that corrode, agricultural facilities within urban areas, copper from brake linings and other automobile constituents.

Added to the challenge of controlling nonpoint sources of pollution is the “reality of uncertainty in water quality management.” The NAS report clearly states that this “reality of uncertainty in water quality management” is a fact that must be acknowledged and addressed. It derives from “our incomplete (system) knowledge or lack of sufficient data to estimate probabilities,”²² and the “inherent variability of natural processes.”²³ As noted in the NAS report, “we are limited by incomplete conceptual understanding of the systems under study, by models that are necessarily simplified representations of the complexity of the natural and socioeconomic systems, as well as by limited data.”²⁴ Further that “not only are waterbodies, watersheds, and their inhabitants characterized by randomness, but they are also open systems in which we cannot know in advance what the boundaries of possible (biological, for example) outcomes will be.”²⁵

Congress can redefine TMDL program success (to that of “improving the condition of waterbodies as measured by attainment of designated uses”) by acknowledging and addressing this “reality of uncertainty in water quality management.” The NAS report strongly recommends that Congress do this by “incorporating the elements of adaptive implementation into TMDL guidelines and regulations.”²⁶ The adaptive implementation approach is a scientific

approach that allows the shift from effluent-based to ambient-based water quality standards, the challenge of nonpoint source pollution control, and the “reality of uncertainty,” to be acknowledged and addressed. Furthermore, the adaptive implementation approach supports a BMP approach until such time as the science is available to move toward effluent-based standards, if necessary. As stated in the NAS report, “The scientific method, which is embodied by the adaptive implementation approach, must be applied to water quality planning if the scientific foundation of the TMDL program is to be increased.”²⁷

Adaptive implementation is defined in the NAS report as “a cyclical process in which TMDL plans are periodically assessed for their achievement of water quality standards including designated uses. If the implementation of the TMDL plan is not achieving attainment of the designated use, scientific data and information should be used to revise the plan.”²⁸ The NAS report reiterates that “If Congress and EPA want to improve the scientific basis of the TMDL program, then the policy barriers that currently inhibit adoption of an adaptive implementation approach to the TMDL program should be addressed.”²⁹

Further, the NAS report states that this adaptive implementation approach:

- “Is needed to ensure that the TMDL program progresses while better data are collected and analyzed with the intent of improving upon initial TMDL plans;”³⁰ and
- “Supports a cautious approach of taking low-cost actions with a high degree of certainty about the outcome, while taking parallel longer-term actions to improve model capabilities and revise control strategies.”³¹

The TMDL Program and Implementation

Involving a waterbody’s stakeholders from the beginning in the TMDL process through the use attainability analysis (to develop and create support for appropriate designated uses) and using an adaptive implementation approach will legitimize the TMDL program and redefine TMDL Program success. However, to *achieve* “future TMDL Program success,”³² the NAS report states that it is “critical that the cost and regulatory burdens for designated use attainment are distributed in a way that is deemed equitable by all stakeholders.”³³

NAFSMA members represent a major set of these stakeholders, the urban surface water management agencies. A significant portion of the “cost and regulatory burdens for designated use attainment” becomes the responsibility of municipalities with implementation of the TMDL plan through the municipal stormwater NPDES permit. As noted in the NAS report, “Under current (1992) regulations, 303d is a planning exercise only. Implementation must be by some other provisions of the Clean Water Act (CWA) or other programs.”³⁴

The municipal stormwater NPDES permit program defines municipal stormwater discharges as point sources and can require numeric standards as the required “standard of compliance” for these discharges. As noted in the NAS report, “Many waterbody stressors currently lie outside

the CWA regulatory framework, where the only federal enforcement tool available is point source discharge limits.”³⁵ Since municipal stormwater discharges are primarily composed of nonpoint source pollutants, the majority of which municipalities do not have the authority to regulate or the ability to control, using numeric water quality standards as the “standard of compliance” for municipal stormwater discharges is not realistic or “equitable”. An example of this local lack of authority is the inability to eliminate metallic brake pads that, as they wear, contribute a significant portion of the copper found in urban runoff. Another example is the local surface water management agencies’ inability to control pet (and wildlife) wastes that often are the source of bacteria exceedances in urban runoff. As noted in the NAS report, “point source permitting is used to impose conditions on point sources that essentially require them to finance control practices for unregulated nonpoint sources.”³⁶

There is a simple solution to this impediment in achieving an “equitable distribution of cost and regulatory burdens for designated use attainment” and TMDL program success. The solution is supported in the 1987 Clean Water Act (CWA) amendments and by the NAS report. Specifically, NAFSMA members recommend that “Congress clarify or amend (if necessary) the Clean Water Act to reiterate the definition of “maximum extent practicable” (MEP) as the technically sound and financially responsible, non-numeric criteria applicable to all municipal stormwater discharges through the implementation of “best management practices” (BMPs).³⁷

Section 402(p)(3)(B) of the 1987 CWA amendments states that the permit provisions for discharges from municipal storm sewers shall:

“Require controls to reduce discharge of pollutants to the *maximum extent practicable*, including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator determines appropriate for the control of such pollutants.”

Although the Ninth Circuit U.S. Court of Appeals ruled in mid-September 1999 that “the Water Quality Act unambiguously demonstrates that Congress did not require municipal storm sewer discharges to comply strictly with 33 U.S. C. 1311 (b)(1)(C)” (i.e., numeric water quality standards). It also ruled, “Under that discretionary provision, EPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. The EPA also has the authority to require less than strict compliance with state water quality standards.”³⁸ Currently EPA has the discretion to apply management practices (BMPs) or numeric limitations in the permits.

NAFSMA members’ view is that requiring a numeric “standard of compliance” for municipal stormwater discharges requires municipalities to assume a significant portion, if not the majority, of the cost and regulatory burdens for designated use attainment. However, more fundamentally, it ignores the science of surface water quality and natural variability of open systems that resulted in the NAS report recommending an adaptive implementation approach. An approach which, as noted previously, “supports a cautious approach of taking low-cost actions with a high degree of certainty about the outcome, while taking parallel longer-term actions to improve model capabilities and revise control strategies.”³⁹

For all these reasons, NAFSMA believes that *successful* implementation of the TMDL program through the municipal stormwater NPDES permit program can only be *achieved if* Congress acts to clarify or amend (if necessary) the Clean Water Act to reiterate the definition of “maximum extent practicable” (MEP) as the technically sound and financially responsible, non-numeric criteria applicable to all municipal stormwater discharges through the implementation of “best management practices” (BMPs).

Then EPA can successfully coordinate TMDL implementation with BMP-based efforts of municipal stormwater Phase I and II NPDES permits and maximize effectiveness by avoiding duplication, conflicts and unnecessary reporting.

In Summary

The National Association of Flood and Stormwater Management Agencies (NAFSMA) believes the National Academy of Sciences’ TMDL report information, discussed in this paper, supports its position on the federal TMDL Program. NAFSMA requests that Congress takes this opportunity to direct EPA to incorporate use attainability analyses, adaptive implementation processes, and a maximum extent practical (MEP) standard implemented through “best management practices” (BMPs) for municipal stormwater permit implementation into the federal TMDL program.

¹ National Association of Flood and Stormwater Management Agencies, Position on Municipal Stormwater Management Program, Washington, DC, January 18, 2002, Available at <http://www.nafsma.org>.

² National Research Council (NRC) of the National Academy of Sciences (NAS), Assessing the TMDL Approach to Water Quality Management, National Academy Press, Washington, D.C., 2001. [<http://www.asiwpca.org/index.htm>]

³ Ibid. p. 4, Executive Summary under Use of Science in the TMDL Program section.

⁴ Ibid. p. 66, Chapter 5 under Review of Water Quality Standards section.

⁵ Ibid. p. 4, Executive Summary under Changes to the TMDL Process section.

⁶ Ibid. p. 66, Chapter 5 under Review of Water Quality Standards section.

⁷ Ibid. p. 66, Chapter 5 under Review of Water Quality Standards section.

^a The NAS report recommends both that “States should develop appropriate use designations for waterbodies in advance of assessment (i.e. “before a waterbody is placed on the action (303d) list”) and refine these use designations prior to TMDL development” (i.e., through a UAA). (Ibid. p. 3, Executive Summary) NAFSMA position is to recommend that Congress make a UAA process the first step of a TMDL process if a waterbody-specific UAA has not been done.

⁸ Ibid. p. 66, Chapter 5 under Review of Water Quality Standards section.

⁹ Ibid. p. 66, Chapter 5 under Review of Water Quality Standards section.

¹⁰ Ibid. pp. 17 and 18, Chapter 2 under Ambient Water Quality Standards section.

¹¹ Ibid. p. 22, relative to “unavoidable social and economic decisions to be made about the desired state for each waterbody”, Chapter 2 under Conclusions and Recommendations section.

¹² Ibid. p. 17, Chapter 2 under Appropriate Designated Uses section.

¹³ Ibid. p. 18, Chapter 2 under Defining a Criterion section.

^b The “description of a desired endpoint for the waterbody” or designated use that the UAA process would define would include identifying a criterion; defined in the report as “a measurable indicator that is a surrogate for use attainment.” (Ibid. p. 18, Chapter 2 under Defining a Criterion section.)

¹⁴ Ibid. p. 3, Executive Summary under TMDL Program Goals section.

^c ...and “not, as currently measured, by the number of TMDL plans completed and approved, nor by the number of NPDES permits issued or cost share dollars spent”. (Ibid. p. 3, Executive Summary under TMDL Program Goals section.)

¹⁵ Ibid. p. 3, Executive Summary under TMDL Program Goals section.

¹⁶ Ibid. p. 21, Chapter 2 under Decision Uncertainty section.

¹⁷ Ibid. p. 74, Chapter 5 under Conclusion and Recommendations section.

¹⁸ Ibid. p. 1, Executive Summary

^d Unlike an effluent standard (applied to a point source), an ambient water quality standard applies to a specific spatial area - a defined waterbody - and is expected to be met over all areas of that waterbody.” (Ibid. p. 16, Chapter 2 under Ambient Water Quality Standards section)

¹⁹ Ibid. p.vii, Preface

²⁰ Ibid. p. 10, Chapter 1 under The Return to Ambient-Based Water Quality Management section.

²¹ Ibid. p. 12, Chapter 1 under National Research Council section.

²² Ibid. p. 21, Chapter 2 under Decision Uncertainty section.

²³ Ibid. p. 21, Chapter 2 under Decision Uncertainty section.

²⁴ Ibid. p. 21, Chapter 2 under Decision Uncertainty section.

²⁵ Ibid. p. 21, Chapter 2 under Decision Uncertainty section.

²⁶ Ibid. p. 74, Chapter 5 under Conclusions and Recommendations section.

²⁷ Ibid. p. 74, Chapter 5 under Conclusions and Recommendations section.

²⁸ Ibid. p. 4, Executive Summary under Changes to the TMDL Process section.

²⁹ Ibid. p. 74, Chapter 5 under Conclusions and Recommendations section.

³⁰ Ibid. p. 4, Executive Summary under Changes to the TMDL Process section.

³¹ Ibid. p. 72, Chapter 5 under TMDL Implementation Challenges, Allocation Issues section.

³² Ibid. p. 73, Chapter 5 under Progressing Toward Adaptive Implementation section.

³³ Ibid. p. 73, Chapter 5 under Progressing Toward Adaptive Implementation section.

³⁴ Ibid. p. 15, Chapter 1, a footnote under current TMDL Process and Report Organization section.

³⁵ Ibid. p. 73, Chapter 5 under Progressing Toward Adaptive Implementation section.

³⁶ Ibid. p. 73, Chapter 5 under Progressing Toward Adaptive Implementation section.

³⁷ See endnote 1, specifically under NAFSMA “maximum extent practicable” (MEP) position statement.

³⁸ Defenders of Wildlife v. Browner, F.3rd 11673, CA 9th Cir. (1999), No. 98-71080, EPA NPDES NO. 97-3, (<http://www.ce9.uscourts.gov>).

³⁹ Ibid. p. 72, Chapter 5 under TMDL Implementation Challenges, Allocation Issues section.